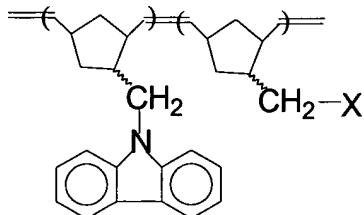


AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the subject Patent Application:

Listing of Claims:

1. (Original) A diblock macroinitiator containing norborene and carbazole segments comprising the formula (I):

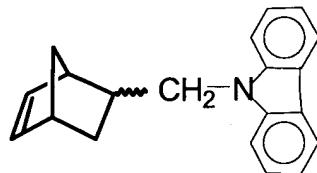


(I)

wherein, X is one selected from a group consisting of Br and Cl.

2. (Currently Amended) The diblock macroinitiator according to claim 1, wherein, said diblock macroinitiator is prepared from a mixture of carbazole-containing norbornene [[-type]] monomer (II) in the presence of catalyst *via* ring-opening metathesis polymerization, an additional norbornene derivative(III) is

added into the mixture after 15-[[~]]120 mins of commencing ring-opening metathesis polymerization and said diblock macroinitiator is obtained, wherein,



(II)

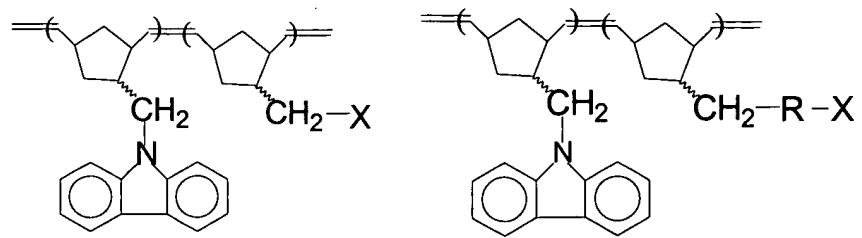


(III)

wherein, X is one selected from a group consisting of Br and Cl .

3. (Original) The diblock macroinitiator according to claim 2, wherein, said metathesis catalyst is $\{\text{Cl}_2\text{Ru}(\text{CHPh})[\text{P}(\text{C}_6\text{H}_{11})_3]_2\}$.

4. (Original) A polynorbornene-containing grafted copolymer comprising the formula (IA), which is prepared by using a diblock macroinitiator with the formula (I):

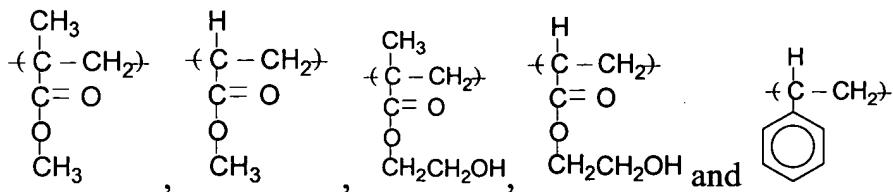


(I)

(IA)

wherein, X is one selected from a group consisting of Br and Cl; and

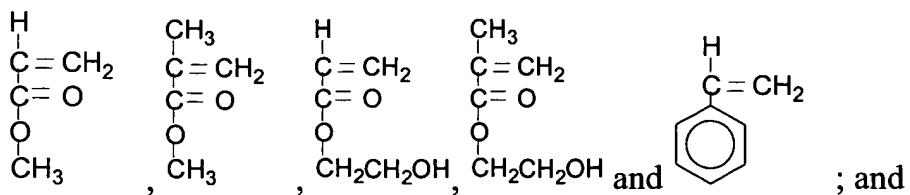
R is one selected from a group consisting of



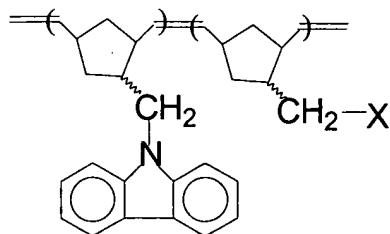
5. (Currently Amended) A method for preparing a grafted polynorbornene with the formula (IA) comprises of following steps :

a) Preparation of a macroinitiator with the formula (I) by means of reaction of cabazole-containing norbornene [[-type]] monomer (II) and a catalyst *via* ring-opening metathesis polymerization and addition of additional norbornene derivative(III) into the mixture after 15~120 mins of commencing ring-opening metathesis polymerization;

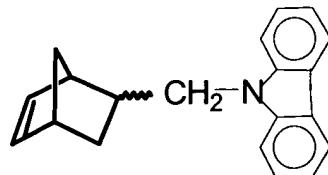
b) preparation of a mixture of Cu(I)Br, 2,2'-bipyridine, said macroinitiator (I) and a monomer selected from a group consisting of



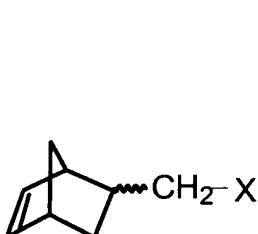
c) preparation of said grafted polynorbornene copolymer with the formula (IA) by means of a graft copolymerization of said mixture at various temperatures ranged from 50 to 150 °C, wherein,



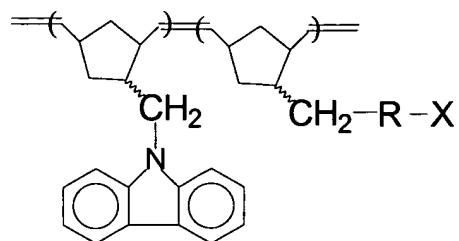
(I)



(II)



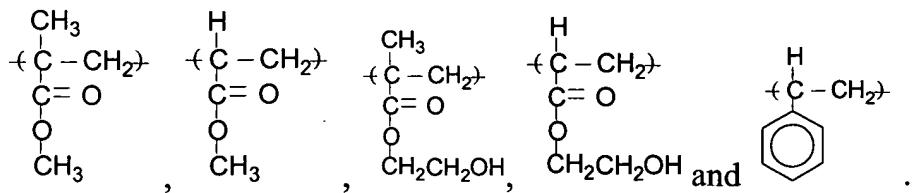
(III)



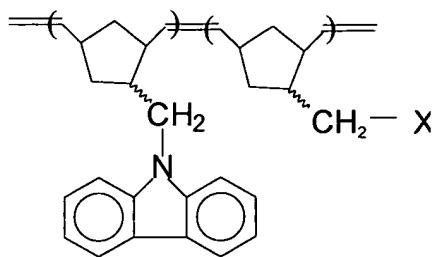
(IA)

wherein, X is one selected from a group consisting of Br and Cl; and

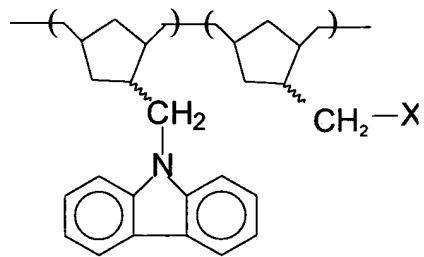
R is one selected from a group consisting of



6. (Withdrawn) A thermally-stable saturated cyclic aliphatic diblock macroinitiator comprising the formula (IV), which is prepared by hydrogenating a diblock macroinitiator with the formula (I):



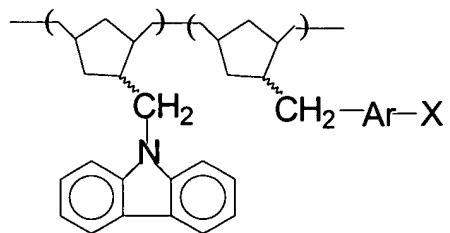
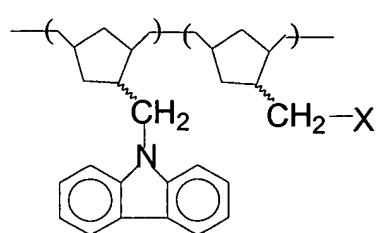
(I)



(IV)

wherein, X is one selected from a group consisting of Br and Cl.

7. (Withdrawn) A polynorbornene-containing grafted copolymer comprising the formula (IVA), which is prepared by graft copolymerization by using a diblock macroinitiator with the formula (IV):

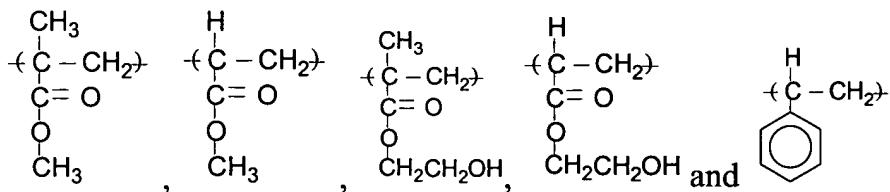


(□)

(□A)

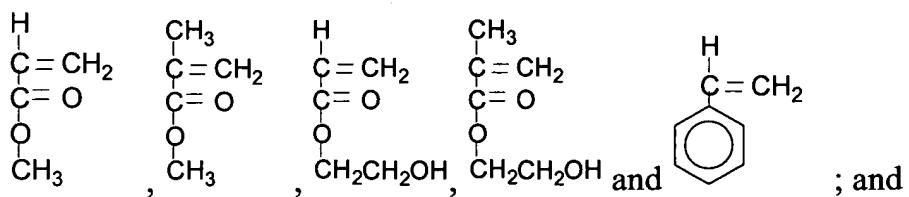
wherein, X is one selected from a group consisting of Br and Cl; and

Ar is one selected from a group consisting of

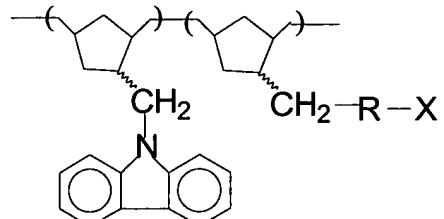
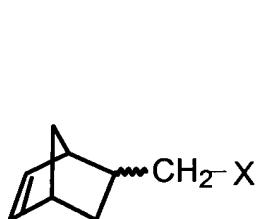
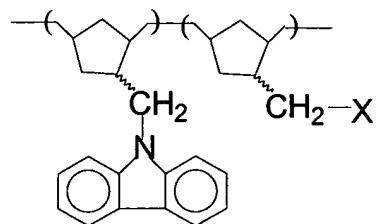
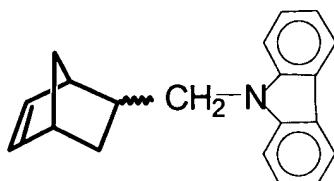


8. (Withdrawn) A Method for preparing a grafted polynorbornene with the formula (IVA) comprises of following steps:

- Preparation of a macroinitiator with the formula (I) by means of reaction of cabazole-containing norbornene-type monomer (II) and a catalyst *via* ring-opening metathesis polymerization and an additional norbornene derivative(III) was added into the mixture after 15~120 mins commencing of ring-opening metathesis polymerization;
- hydrogenation of said diblock macroinitiator with the formula (I) to prepare a thermally-stable saturated cyclic aliphatic diblock macroinitiator with the formula (IV);
- preparation of a mixture of Cu(I)Br, 2,2'-bipyridine, said thermally-stable saturated cyclic aliphatic diblock macroinitiator (IV) and a monomer selected from a group consisting of

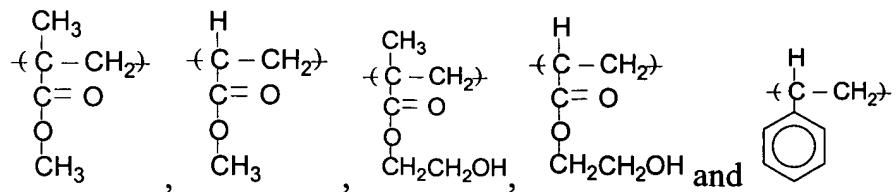


d) preparation of said grafted polynorbornene copolymer with the formula (IVA) by means of a graft copolymerization of said mixture at various temperatures ranged from 50 to 150 $^{\circ}\text{C}$, wherein,

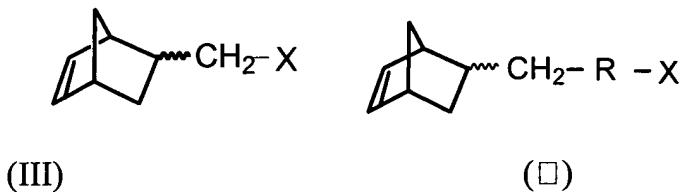


wherein, X is one selected from a group consisting of Br and Cl; and

R is one selected from a group consisting of

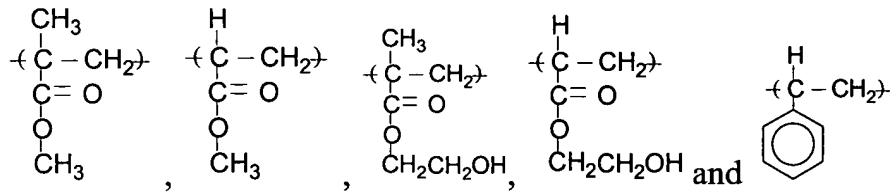


9. (Withdrawn) A norbornene-containing macrromonomer comprising the formula (V), which is prepared by using a norbornene end group-containing initiator with the formula (III):



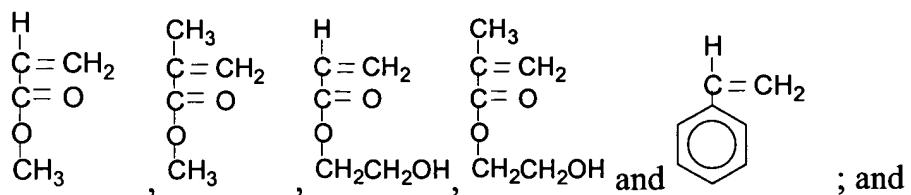
wherein, X is one selected from a group consisting of Br and Cl; and

R is one selected from a group consisting of

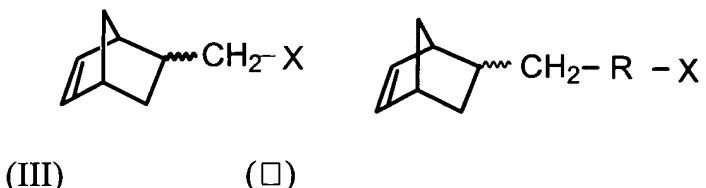


10. (Withdrawn) A method for preparing a norbornene end group-containing macrmonomer with the formula (V) comprises of following steps:

a) Preparation of a mixture of Cu(I)Br, 2,2'-bipyridine, a norbornene-type initiator (III) and a monomer selected from a group consisting of

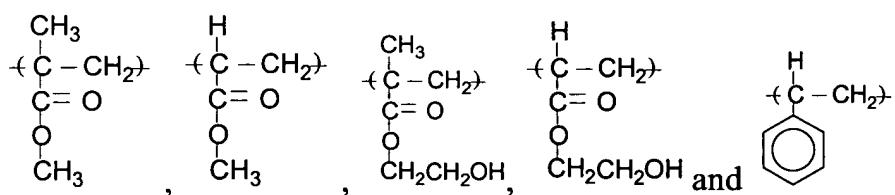


b) preparation of said norbornene end group-containing macromonomer with the formula (V) by means of radical polymerization of said mixture at various temperatures ranged from 50 to 150 °C, wherein,

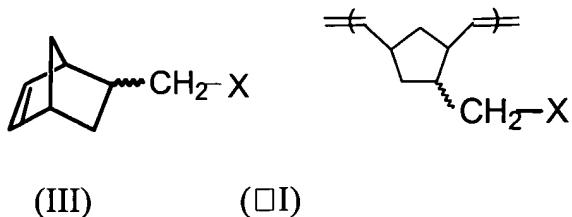


wherein, X is one selected from a group consisting of Br and Cl; and

R is one selected from a group consisting of

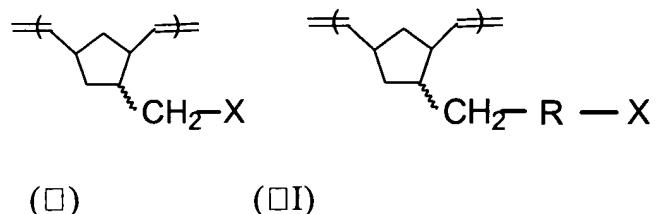


11. (Withdrawn) A norbornene-type macroinitiator comprising the formula (VI), which is prepared by using a catalyst and a norbornene-type derivative with the formula (III) *via* ring-opening metathesis polymerization:

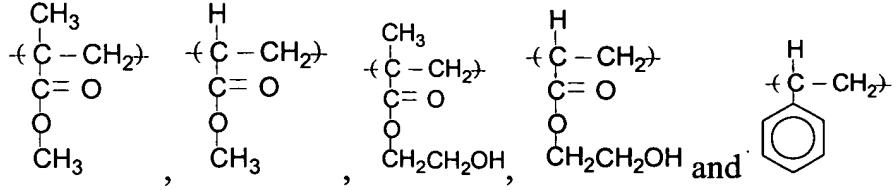


wherein, X is one selected from a group consisting of Br and Cl.

12. (Withdrawn) A polynorbornene-containing grafted copolymer comprising the formula (VII), which is prepared by using a macroinitiator with the formula (VI) *via* graft copolymerization :

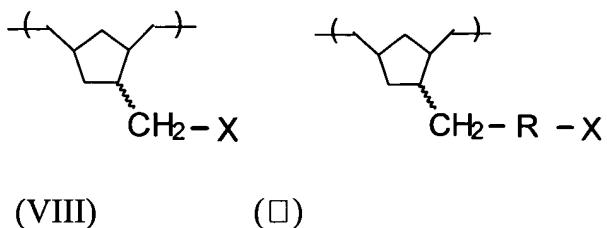


wherein, X is one selected from a group consisting of Br and Cl; and R is one selected from a group consisting of



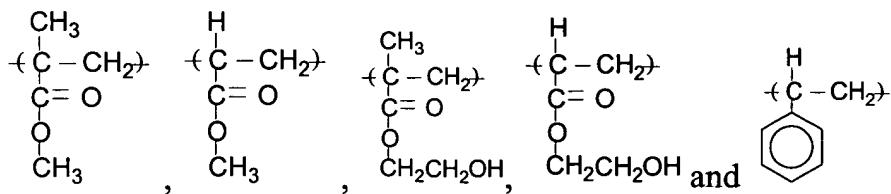
13. (Withdrawn) A saturated cyclic aliphatic polynorbornene-containing grafted copolymer comprising the formula (IX), which is prepared by using a

saturated cyclic aliphatic macroinitiator with the formula (VIII) *via* graft copolymerization :



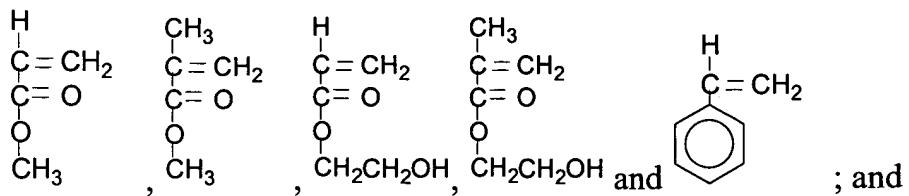
wherein, X is one selected from a group consisting of Br and Cl ; and

R is one selected from a group consisting of

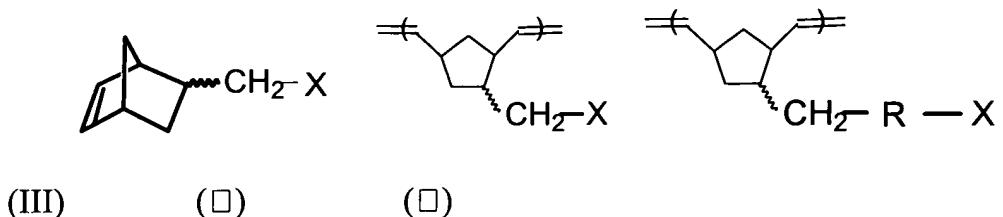


14. (Withdrawn) A method for preparing grafted polynorbornene copolymer with the formula (VII) comprises of following steps:

- Polymerization a norbornene monomer with the formula (III) by using a catalyst *via* ring-opening metathesis polymerization, to obtain a macroinitiator with the formula (VI);
- preparation of a mixture of $\text{Cu}(\text{I})\text{Br}$, 2,2'-bipyridine, said macroinitiator (VI) and a monomer selected from a group consisting of

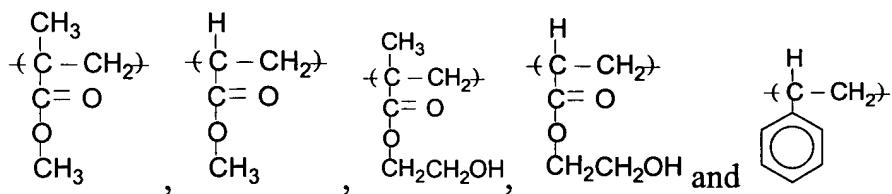


c) preparation of said grafted polynorbornene copolymer with the formula (VII) by means of a graft copolymerization of said mixture at various temperatures ranged from 70 to 150 $^{\circ}\text{C}$, wherein,



wherein, X is one selected from a group consisting of Br and Cl; and

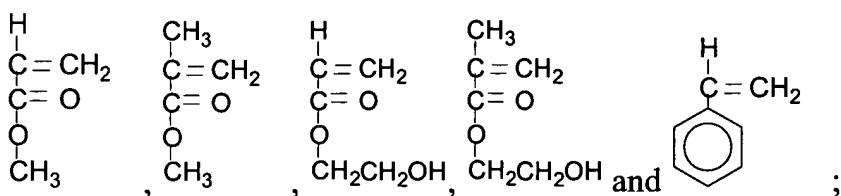
R is one selected from a group consisting of



15. (Withdrawn) A method for preparing grafted polynorbornene copolymer with the formula (IX) comprises of following steps:

a) Polymerization of a norbornene monomer with the formula (III) by using a catalyst *via* ring-opening metathesis polymerization, to obtain a macroinitiator with the formula (VI);

b) preparation of a mixture of Cu(I)Br, 2,2'-bipyridine, said macroinitiator (VI) and a monomer selected from a group consisting of

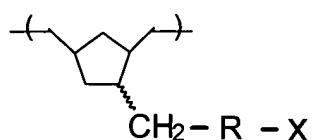
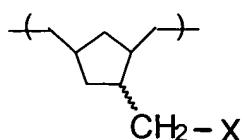


c) hydrogenation of said macroinitiator with the formula (VII) to prepare a thermally-stable saturated cyclic aliphatic macroinitiator with the formula (VIII); and

d) preparation of a grafted polynorbornene with the formula (IX) by means of radical polymerization of said mixture at various temperatures ranged from 50 to 150 °C, wherein,



(III)

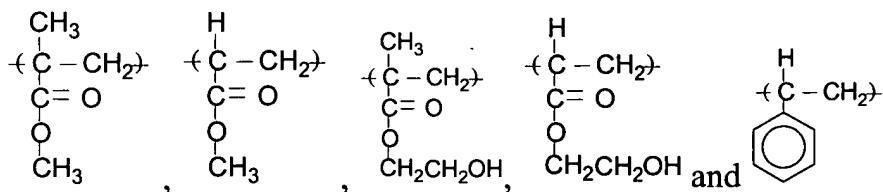


(□II)

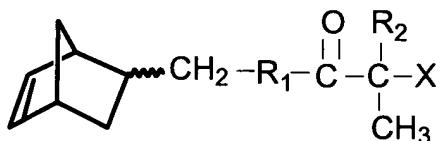
(□)

wherein, X is one selected from a group consisting of Br and Cl; and

R is one selected from a group consisting of



16. (Withdrawn) A norbornene-type compound containing bromo-end group, having the formula (XI):



(XI)

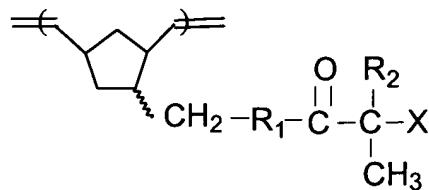
wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

wherein, n denotes an integer of 1 to 4; and

R₂ is H or -CH₃.

17. (Withdrawn) A polynorbornene-type macroinitiator containing halogen-side group, having the formula (XII):



(XII)

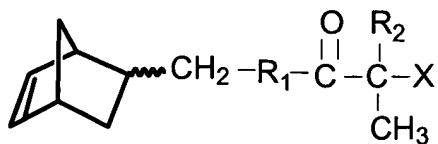
wherein, X is Br or Cl ;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

wherein, n denotes an integer of 1 to 4.; and

R₂ is H or -CH₃ . .

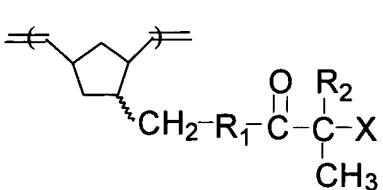
18. (Withdrawn) The macroinitiator according to claim 17, wherein, said macroinitiator is prepared from a halogen-containing norbornene-type compound (XI) in the presence of catalyst *via* ring-opening metathesis polymerization, wherein, .



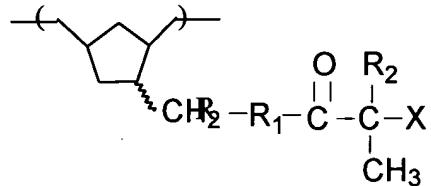
(XI)

19. (Withdrawn) The macroinitiator according to claim 18, wherein, said metathesis catalyst is $\{\text{Cl}_2\text{Ru}(\text{CHPh})[\text{P}(\text{C}_6\text{H}_{11})_3]_2\}$.

20. (Withdrawn) A thermally-stable saturated cyclic aliphatic macroinitiator comprising the formula (XIII), which is prepared by hydrogenating a macroinitiator with the formula (XII):



(XII)



(XIII)

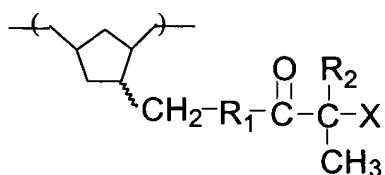
wherein, X is Br or Cl;

R_1 is $-\text{NH}-$, $-\text{O}-$, $-(\text{CH}_2)_n-\text{NH}-$ or $-(\text{CH}_2)_n-\text{O}-$,

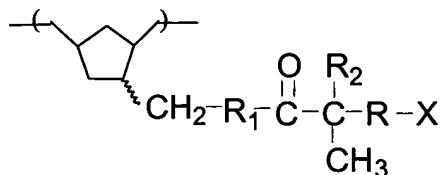
wherein, n denotes an integer of 1 to 4 ; and

R_2 is H or $-\text{CH}_3$.

21. (Withdrawn) A grafted polynorbornene copolymer comprising the formula (XIV), which is prepared by using a macroinitiator with the formula (XIII) *via* graft copolymerization:



(XIII)



(XIV)

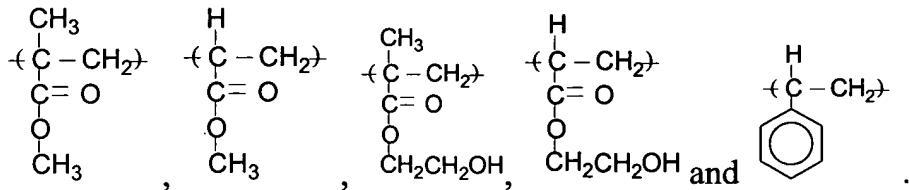
wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

wherein, n denotes an integer of 1 to 4;

R₂ is H or -CH₃; and

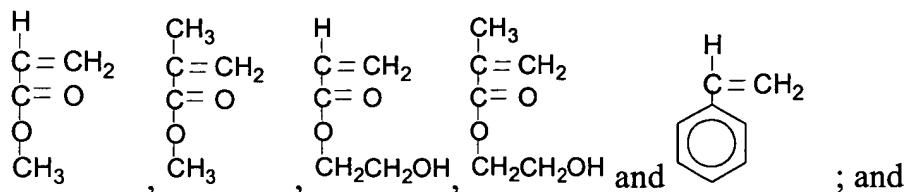
R is one selected from a group consisting of



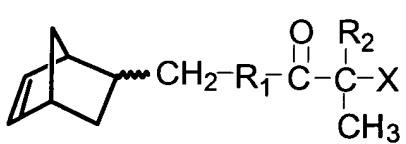
22. (Withdrawn) A method for preparing grafted polynorbornene copolymer with the formula (XIV) comprises of following steps:

- Polymerization of a norbornene monomer with the formula (XI) by using a catalyst *via* ring-opening metathesis polymerization to obtain a macroinitiator with the formula (XII);
- hydrogenation of said macroinitiator with the formula (VII) to prepare a thermally-stable saturated cyclic aliphatic macroinitiator with the formula (VIII);

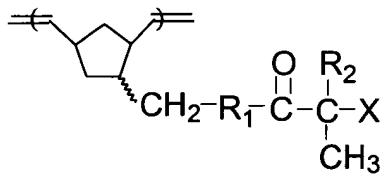
c) preparation of a mixture of Cu(I)Br, 2,2'-bipyridine, said thermally-stable saturated cyclic aliphatic macroinitiator (VIII) and a monomer selected from a group consisting of



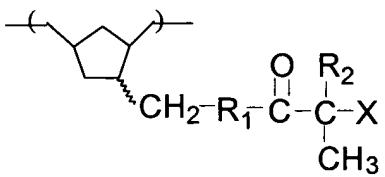
d) preparation of a grafted polynorbornene with the formula (XIV) by means of radical polymerization of said mixture at various temperatures ranged from 50 to 150 °C, wherein,



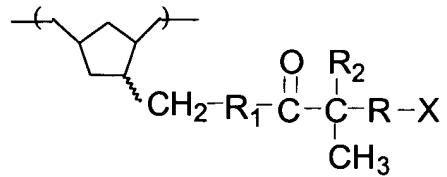
(XI)



(XII)



(XIII)



(XIV)

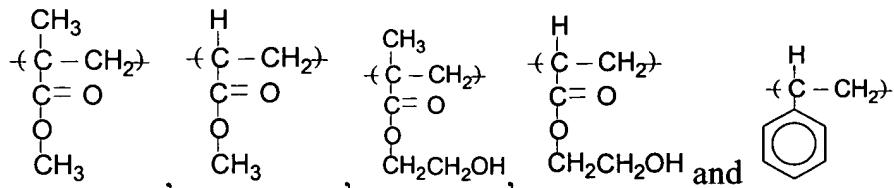
wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH- or -(CH₂)_n-O-,

wherein, n denotes an integer of 1 to 4 ;

R_2 is H or $-CH_3$; and

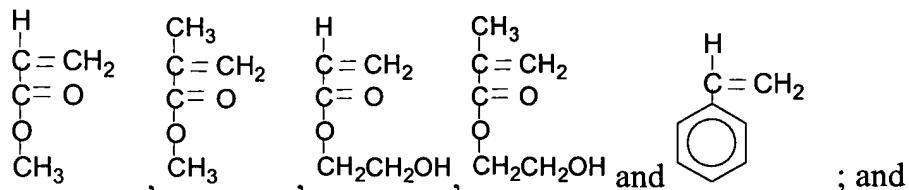
R is one selected from a group consisting of



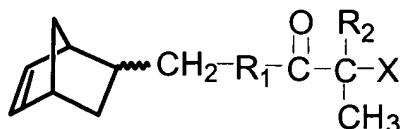
23. (Withdrawn) A method for preparing grafted polynorbornene copolymer with the formula (XIVA) comprises of following steps:

a) Polymerization of a norbornene monomer with the formula (XI) by using a catalyst *via* ring-opening metathesis polymerization, to obtain a macroinitiator with the formula (XII);

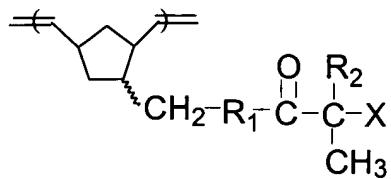
b) preparation of a mixture of Cu(I)Br, 2,2'-bipyridine, said macroinitiator (VII) and a monomer selected from a group consisting of



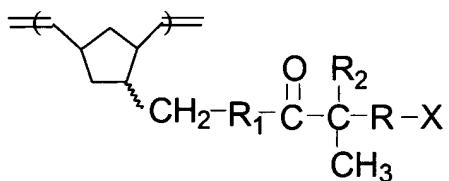
c) preparation of a grafted polynorbornene with the formula (XIVA) by means of radical polymerization of said mixture at various temperatures ranged from 50 to 150 $^{\circ}\text{C}$, wherein,



(XI)



(XII)



(XIV A)

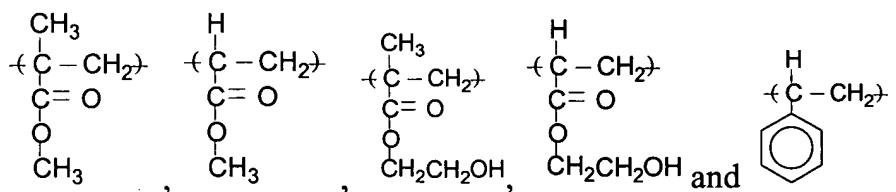
wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

wherein, n denotes an integer of 1 to 4;

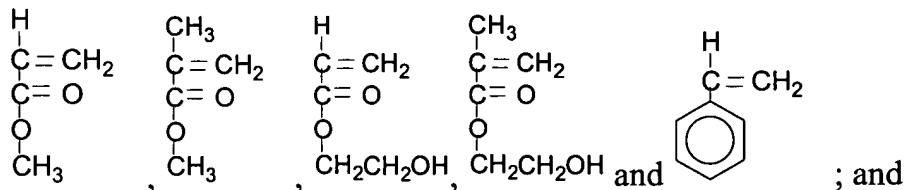
R₂ is H or -CH₃; and

R is one selected from a group consisting of

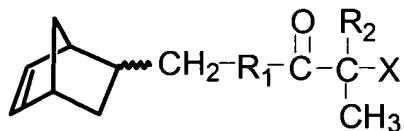


24. (Withdrawn) A method for preparing norbornene end group-containing macromonomer with the formula (XV) comprises of following steps:

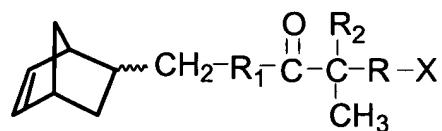
a) Preparation of a mixture of Cu(I)Br, 2,2'-bipyridine, a norbornene derivative (XI) and a monomer selected from a group consisting of



b) preparation of a norbornene end group-containing macromonomer with the formula (XV) by means of radical polymerization of said mixture at various temperatures ranged from 50 to 150 °C, wherein,



(XI)



(XV)

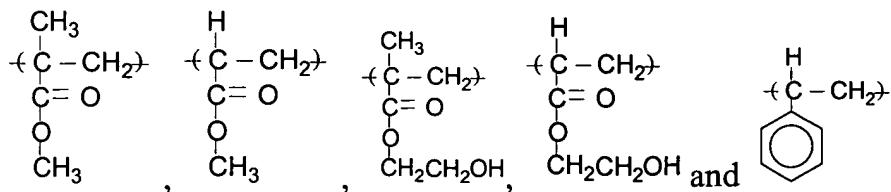
wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

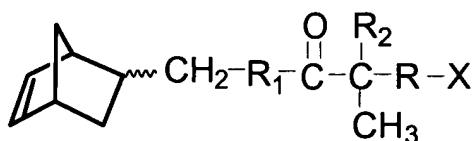
wherein, n denotes an integer of 1 to 4;

R₂ is H or -CH₃; and

R is one selected from a group consisting of



25. (Withdrawn) A norbornene end group-containing macromonomer comprises of formula (XV):



(XV)

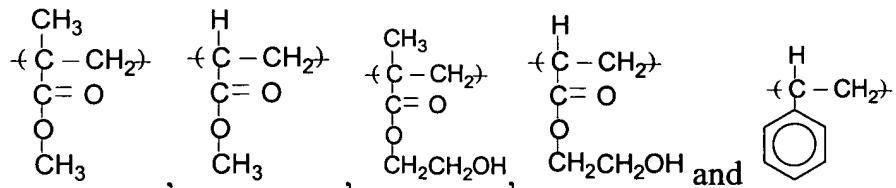
wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

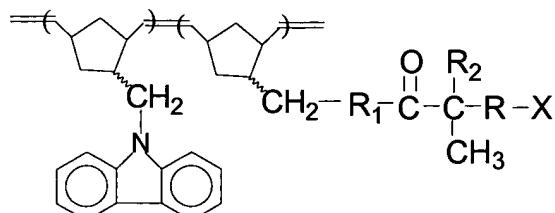
wherein, n denotes an integer of 1 to 4;

R₂ is H or -CH₃; and

R is one selected from a group consisting of



26. (Withdrawn) A copolymer containing carbazole and halo- side groups comprising the formula (XVI):



(XVI)

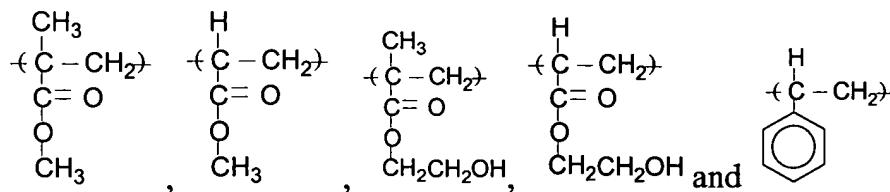
wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

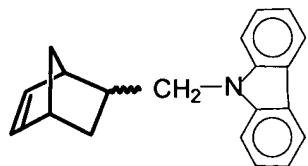
wherein, n denotes an integer of 1 to 4;

R₂ is H or -CH₃; and

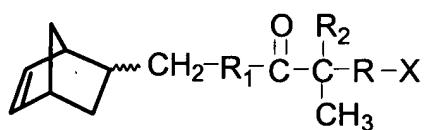
R is one selected from a group consisting of



27. (Withdrawn) The copolymer according to claim 26, wherein, said copolymer macroinitiator is prepared from a mixture of carbazole-containing norbornene-type monomer (II) and a macromonomer with the formula (XV) in the presence of catalyst *via* ring-opening metathesis polymerization, wherein,



(II)



(XV)

wherein, X is Br or Cl;

R₁ is -NH-, -O-, -(CH₂)_n-NH-, or -(CH₂)_n-O-,

wherein, n denotes an integer of 1 to 4;

R₂ is H or -CH₃; and

R is one selected from a group consisting of

